

CLAIMS

1. A specimen enclosure assembly for use in an electron microscope and comprising:
 - 5 a rigid specimen enclosure dish having an aperture and defining an enclosed specimen placement volume;
 - an electron beam permeable, fluid impermeable, cover sealing said specimen placement volume at said aperture from a volume outside said enclosure; and
 - a pressure controller communicating with said enclosed specimen
- 10 placement volume and being operative to maintain said enclosed specimen placement volume at a pressure which exceeds a vapor pressure of a liquid sample in said specimen placement volume and is greater than a pressure of a volume outside said enclosure, whereby a pressure differential across said cover does not exceed a threshold level at which rupture of said cover would occur.
- 15 2. A specimen enclosure assembly according to claim 1 and wherein said pressure controller comprises a passageway communicating with said enclosed specimen placement volume.
- 20 3. A specimen enclosure assembly according to claim 2 and wherein said passageway comprises a tube having a lumen whose cross section is sufficiently small as to maintain said pressure, which exceeds said vapor pressure of said liquid sample in said specimen placement volume and is greater than said pressure of said volume outside said enclosure, for a time period of at least 15 minutes.
- 25 4. A specimen enclosure assembly according to claim 3 and wherein said tube communicates with a fluid reservoir.
5. A specimen enclosure assembly according to any of the preceding
- 30 claims 1-4 and also comprising a liquid ingress and egress assembly permitting supply and removal of liquid from said enclosed specimen placement volume.

6. A specimen enclosure assembly according to claim 5 and wherein said liquid ingress and egress assembly comprises at least two tubes.

7. A specimen enclosure assembly for use in an electron microscope and comprising:

a rigid specimen enclosure dish having an aperture and defining an enclosed specimen placement volume;

an electron beam permeable, fluid impermeable, cover sealing said specimen placement volume at said aperture from a volume outside said enclosure; and

10 a liquid ingress and egress assembly permitting supply and removal of liquid from said enclosed specimen placement volume.

8. A specimen enclosure assembly according to claim 7 and wherein said liquid ingress and egress assembly comprises at least two tubes.

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9. A scanning electron microscope assembly comprising:

a scanning electron microscope defining an examination volume;

a specimen enclosure assembly disposed in said examination volume and including:

20 a rigid specimen enclosure dish having an aperture and defining an enclosed specimen placement volume;

an electron beam permeable, fluid impermeable, cover sealing said specimen placement volume at said aperture from a volume outside said enclosure; and

25 a pressure controller communicating with said enclosed specimen placement volume and being operative to maintain said enclosed specimen placement volume at a pressure which exceeds a vapor pressure of a liquid sample in said specimen placement volume and is greater than a pressure of a volume outside said enclosure, whereby a pressure differential across said cover does not exceed a threshold level at which rupture of said cover would occur.

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10. A scanning electron microscope assembly according to claim 9 and wherein said pressure controller comprises a passageway communicating with said

enclosed specimen placement volume.

11. A scanning electron microscope assembly according to claim 10 and wherein said passageway comprises a tube having a lumen whose cross section is
5 sufficiently small as to maintain said pressure, which exceeds said vapor pressure of said liquid sample in said specimen placement volume and is greater than said pressure of said volume outside said enclosure, for a time period of at least 15 minutes.

12. A scanning electron microscope assembly according to claim 11 and
10 wherein said tube communicates with a fluid reservoir.

13 A scanning electron microscope assembly according to any of the preceding claims 9-12 and also comprising a liquid ingress and egress assembly permitting supply and removal of liquid from said enclosed specimen placement
15 volume.

14. A scanning electron microscope assembly according to claim 13 and wherein said liquid ingress and egress assembly comprises at least two tubes.

20 15. A specimen enclosure assembly for use in an electron microscope and comprising:

a fluid reservoir;

a plurality of rigid specimen enclosure dishes, each having an aperture and defining an enclosed specimen placement volume, said plurality of rigid specimen
25 enclosure dishes communicating with said fluid reservoir;

an electron beam permeable, fluid impermeable, cover sealing each said specimen placement volume at said aperture from a volume outside each said enclosure; and

a pressure controller communicating with said fluid reservoir and being
30 operative to maintain said enclosed specimen placement volumes at a pressure which exceeds a vapor pressure of a liquid sample in said specimen placement volumes and is greater than a pressure of a volume outside said fluid reservoir, whereby a pressure

differential across said covers does not exceed a threshold level at which rupture of said covers would occur.

16. A specimen enclosure assembly according to claim 15 and wherein said
5 pressure controller comprises a passageway.

17. A specimen enclosure assembly according to claim 16 and wherein said
passageway comprises a tube having a lumen whose cross section is sufficiently small
as to maintain said pressure, which exceeds said vapor pressure of said liquid sample in
10 said specimen placement volume and is greater than said pressure of said volume
outside said plurality of enclosures, for a time period of at least 15 minutes.

18. A specimen enclosure assembly according to claim 17 and wherein said
tube communicates with said fluid reservoir.
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19. A specimen enclosure assembly according to any of the preceding
claims 15-18 and also comprising a liquid ingress and egress assembly permitting
supply and removal of liquid from said enclosed specimen placement volume.

20. 20. A specimen enclosure assembly according to claim 19 and wherein said
liquid ingress and egress assembly comprises at least two tubes.